

WHAT IS CLAIMED IS:

1. A separator comprising:
an input compartment having an input opening and an output
5 ledge, a manure slurry being pumped into the input compartment
through the input opening, and flowing out over the output ledge;
a sloped screen connected to the output ledge of the input
compartment, the sloped screen having a plurality of screen openings,
the screen openings having a size that ranges from a lower size to an
10 upper size, the lower size being greater than a size that requires shaking
before the manure slurry will fall through the screen openings, the
upper size being equal to or less than 1mm, the manure slurry flowing
out over the output ledge onto the sloped screen when the manure
slurry is pumped into the input compartment; and
15 a collection compartment connected to the sloped screen, the
collection compartment having an air flow opening and a slurry exit
opening, and receiving a screened slurry that falls through the sloped
screen when the manure slurry is pumped into the input compartment,
the screened slurry flowing out through the slurry exit opening.
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2. The separator of claim 1 and further comprising:
a water pipe connected to the collection compartment that
extends across the sloped screen; and
a plurality of spray heads connected to the water pipe, the spray
25 heads outputting a liquid at a rate, the rate being greater than seventy
liters per hour, and less than one thousand liters per hour.

3. The separator of claim 2 and further comprising an air flow controller connected to the collection compartment, the air flow controller controlling a first volume of air that flows through the sloped screen as a result of the screened slurry flowing through the slurry exit opening.

4. The separator of claim 3 wherein the air flow controller variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

5. The separator of claim 4 wherein the input compartment includes a baffle that insures that the manure slurry flows evenly across the output ledge.

6. A separator comprising:
an input compartment having an input opening and an output ledge, a manure slurry being pumped into the input compartment through the input opening, and flowing out over the output ledge;
a sloped screen connected to the output ledge of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from a lower size to an upper size, the lower size being greater than a size that requires shaking before the manure slurry will fall through the screen openings, the upper size being equal to or less than 0.89mm, the manure slurry flowing out over the output ledge onto the sloped screen when the manure slurry is pumped into the input compartment; and

a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening, and receiving a screened slurry that falls through the sloped screen when the manure slurry is pumped into the input compartment,
5 the screened slurry flowing out through the slurry exit opening.

7. The separator of claim 6 and further comprising:
a water pipe connected to the collection compartment that extends across the sloped screen; and
10 a plurality of spray heads connected to the water pipe, the spray heads outputting a liquid at a rate, the rate being greater than seventy liters per hour, and less than one thousand liters per hour.

8. The separator of claim 7 and further comprising an air flow
15 controller connected to the collection compartment, the air flow controller controlling a first volume of air that flows through the sloped screen as a result of the screened slurry flowing through the slurry exit opening.

20 9. The separator of claim 8 wherein the air flow controller variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

25 10. The separator of claim 9 wherein the input compartment includes a baffle that insures that the manure slurry flows evenly across the output ledge.

11. A separator comprising:

an input compartment having an input opening and an output ledge, a manure slurry being pumped into the input compartment through the input opening, and flowing out over the output ledge;

5 a sloped screen connected to the output ledge of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from a lower size to an upper size, the lower size being greater than a size that requires shaking before the manure slurry will fall through the screen openings, the
10 upper size being equal to or less than 0.64mm, the manure slurry flowing out over the output ledge onto the sloped screen when the manure slurry is pumped into the input compartment; and

a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit
15 opening, and receiving a screened slurry that falls through the sloped screen when the manure slurry is pumped into the input compartment, the screened slurry flowing out through the slurry exit opening.

12. The separator of claim 11 and further comprising:

20 a water pipe connected to the collection compartment that extends across the sloped screen; and

a plurality of spray heads connected to the water pipe, the spray heads outputting a liquid at a rate, the rate being greater than seventy liters per hour, and less than one thousand liters per hour.

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13. The separator of claim 12 and further comprising an air flow controller connected to the collection compartment, the air flow controller controlling a first volume of air that flows through the sloped

screen as a result of the screened slurry flowing through the slurry exit opening.

14. The separator of claim 13 wherein the air flow controller
5 variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

15. The separator of claim 14 wherein the input compartment
10 includes a baffle that insures that the manure slurry flows evenly across the output ledge.

16. A separator comprising:
an input compartment having an input opening and an output
15 opening;
a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from equal to or greater than 0.18mm to equal to or less than 1mm; and
20 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

17. The separator of claim 16 and further comprising:
25 a water pipe connected to the collection compartment that extends across the sloped screen; and

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a plurality of spray heads connected to the water pipe, the spray heads outputting a liquid at a rate, the rate being greater than seventy liters per hour, and less than one thousand liters per hour.

5 18. The separator of claim 17 and further comprising an air flow controller connected to the collection compartment, the air flow controller controlling a first volume of air that flows through the sloped screen.

10 19. The separator of claim 18 wherein the air flow controller variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

15 20. A separator comprising:
 an input compartment having an input opening and an output opening;

 a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings,
20 the screen openings having a size that ranges from about 0.18mm to equal to or less than 1mm; and

 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

25 21. The separator of claim 20 and further comprising:
 a water pipe connected to the collection compartment that extends across the sloped screen; and

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a plurality of spray heads connected to the water pipe, the spray heads outputting a liquid at a rate, the rate being greater than seventy liters per hour, and less than one thousand liters per hour.

5 22. The separator of claim 21 and further comprising an air flow controller connected to the collection compartment, the air flow controller controlling a first volume of air that flows through the sloped screen.

10 23. The separator of claim 22 wherein the air flow controller variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

15 24. A separator comprising:
 an input compartment having an input opening and an output opening;
 a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings,
20 the screen openings having a size that ranges from about 0.18mm to equal to or less than 0.89mm; and
 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

25 25. The separator of claim 24 and further comprising:
 a water pipe connected to the collection compartment that extends across the sloped screen; and

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a plurality of spray heads connected to the water pipe, the spray heads outputting a liquid at a rate, the rate being greater than seventy liters per hour, and less than one thousand liters per hour.

5 26. The separator of claim 25 and further comprising an air flow controller connected to the collection compartment, the air flow controller controlling a first volume of air that flows through the sloped screen.

10 27. The separator of claim 26 wherein the air flow controller variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

15 28. A separator comprising:
 an input compartment having an input opening and an output opening;
 a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings,
20 the screen openings having a size that ranges from about 0.18mm to equal to or less than 0.64mm; and
 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

25 29. A separator comprising:
 an input compartment having an input opening and an output opening;

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a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from equal to or greater than 0.18mm to equal to or less than 0.89mm; and

- 5 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

30. A separator comprising:

- 10 an input compartment having an input opening and an output opening;

 a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from equal to or greater

- 15 than 0.18mm to equal to or less than 0.64mm; and

 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

- 20 31. A separator comprising:

 an input compartment having an input opening and an output ledge, a manure slurry being pumped into the input compartment through the input opening, and flowing out over the output ledge;

- a sloped screen connected to the output ledge of the input
25 compartment, the sloped screen having a plurality of screen openings and a width, the manure slurry flowing out over the output ledge onto the sloped screen when the manure slurry is pumped into the input compartment;

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a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening, and receiving a screened slurry that falls through the sloped screen when the manure slurry is pumped into the input compartment,
5 the screened slurry flowing out through the slurry exit opening;

a water pipe connected to the collection compartment that extends across the sloped screen; and

a plurality of spray heads connected to the water pipe, the spray heads outputting a liquid at a rate, the rate ranging from equal to or
10 greater than 113 liters per hour to equal to or less than 1362 liters per hour per approximately 0.31 meters of the width.

32. The separator of claim 31 and further comprising an air flow controller connected to the collection compartment, the air flow
15 controller controlling a first volume of air that flows through the sloped screen as a result of the screened slurry flowing through the slurry exit opening.

33. The separator of claim 32 wherein the air flow controller
20 variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

34. A separator comprising:
25 an input compartment having an input opening and an output opening, a manure slurry being pumped into the input compartment through the input opening, and flowing out through the output opening;

a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings and a width, the manure slurry flowing out over the output opening onto the sloped screen when the manure slurry is pumped into the input compartment;

5 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening, and receiving a screened slurry that falls through the sloped screen when the manure slurry is pumped into the input compartment, the screened slurry flowing out through the slurry exit opening; and

10 an air flow controller connected to the collection compartment, the air flow controller controlling a first volume of air that flows through the sloped screen as a result of the screened slurry flowing through the slurry exit opening.

15 35. The separator of claim 34 wherein the air flow controller variably controls a second volume of air that can flow into the air flow opening to thereby vary the first volume of air that is pulled through the sloped screen.

20 36. The separator of claim 35 and further comprising:
a water pipe connected to the collection compartment that extends across the sloped screen; and
a plurality of spray heads connected to the water pipe, the spray
25 heads outputting a liquid at a rate, the rate ranging from equal to or greater than 113 liters per hour to equal to or less than 1362 liters per hour per approximately 0.31 meters of the width.

37. A manure management system comprising:

a first holding basin that holds a flushed manure slurry;

a first separator, the first separator having a first sloped screen,
the first sloped screen having a plurality of openings, the first separator
5 receiving the flushed manure slurry and outputting a once-screened
slurry;

a first pumping system placed in the first holding basin and
connected to the first separator, the first pumping system pumping the
flushed manure slurry from the first holding basin to the first separator;

10 a second separator, the second separator receiving the once-
screened slurry and outputting a twice-screened slurry, the second
separator having:

an input compartment that receives the once-screened
slurry, the input compartment having a input opening and an output
15 opening;

a second sloped screen connected to the output opening
of the input compartment, the second sloped screen having a plurality of
openings and a width, the once-screened slurry flowing over the second
sloped screen when slurry flows into the input compartment;

20 a collection compartment connected to the second sloped
screen, the collection compartment having an air flow opening and a
slurry exit opening, and receiving a second-screened slurry that falls
through the second sloped screen, the second-screened slurry flowing
out through the slurry exit opening.

25 38. The system of claim 37 and further comprising an air flow
controller connected to the collection compartment, the air flow
controller controlling a volume of air that flows through the second

sloped screen as a result of the second-screened slurry flowing through the slurry exit opening.

39. The system of claim 37 wherein the openings in the first
5 sloped screen are larger than the openings in the second sloped screen.

40. The system of claim 37 and further comprising:
a second holding basin that receives the once-screened slurry;
and
10 a second pumping system placed in the second holding basin and
connected to the second separator, the second pumping system
pumping once-screened slurry from the second holding basin to the
second separator.

41. The separator of claim 38 wherein the air flow controller
15 variably controls a second volume of air that can flow into the air flow
opening to thereby vary the first volume of air that is pulled through the
sloped screen.

42. The separator of claim 37 and further comprising:
20 a water pipe connected to the collection compartment that
extends across the sloped screen; and
a plurality of spray heads connected to the water pipe, the spray
heads outputting a liquid at a rate, the rate ranging from equal to or
25 greater than 113 liters per hour to equal to or less than 1362 liters per
hour per approximately 0.31 meters of the width.

43. A method for removing solids from a manure slurry, the method comprising the steps of:

running the manure slurry over a slopped screen, the slopped screen having a plurality of screen openings and a width, the screen openings having a size that ranges from a lower size to an upper size, the lower size being greater than a size that requires shaking before the manure slurry will fall through the screen openings, the upper size being equal to or less than 1mm; and
collecting a screened slurry that falls through the sloped screen in a collection compartment.

44. The method of claim 43 and further comprising the step of spraying the manure slurry with a liquid with sprayers at a rate, the rate ranging from equal to or greater than 113 liters per hour to equal to or less than 1362 liters per hour per approximately 0.31 meters of the width.

45. The method of claim 44 and further comprising the step of controlling a volume of air that flows through the sloped screen.

46. A method for removing solids from a manure slurry, the method comprising the steps of:

running the manure slurry over a slopped screen, the slopped screen having a plurality of screen openings and a width, the screen openings having a size that ranges from about 0.18mm to equal to or less than 1mm; and

collecting a screened slurry that falls through the sloped screen in a collection compartment.

47. The method of claim 46 and further comprising the step of spraying the manure slurry with a liquid with sprayers at a rate, the rate ranging from equal to or greater than 113 liters per hour to equal to or less than 1362 liters per hour per approximately 0.31 meters of the width.

48. The method of claim 47 and further comprising the step of controlling a volume of air that flows through the sloped screen.

49. A method for removing solids from a manure slurry, the method comprising the steps of:
running the manure slurry over a slopped screen, the slopped screen having a plurality of screen openings and a width, the screen openings having a size that ranges from 0.23mm to equal to or less than 89mm; and
collecting a screened slurry that falls through the sloped screen in a collection compartment.

50. The method of claim 49 and further comprising the step of spraying the manure slurry with a liquid with sprayers at a rate, the rate ranging from equal to or greater than 113 liters per hour to equal to or less than 1362 liters per hour per approximately 0.31 meters of the width.

51. A method for removing solids from a manure slurry, the method comprising the steps of:

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running the manure slurry over a slopped screen, the slopped screen having a width and a plurality of screen openings;

spraying the manure slurry with a liquid with sprayers at a rate, the rate ranging from equal to or greater than 113 liters per hour to equal to or less than 1362 liters per hour per approximately 0.31 meters of the width; and

collecting a screened slurry that falls through the sloped screen in a collection compartment.

10 52. The method of claim 51 and further comprising the step of controlling a volume of air that flows through the sloped screen.

53. A method for removing solids from a manure slurry, the method comprising the steps of:

15 running the manure slurry over a slopped screen, the slopped screen having a width and a plurality of screen openings;

controlling a volume of air that flows through the sloped screen; and

collecting a screened slurry that falls through the sloped screen in
20 a collection compartment.

54. The method of claim 53 and further comprising the step of spraying the manure slurry with a liquid with sprayers at a rate, the rate ranging from equal to or greater than 113 liters per hour to equal to or
25 less than 1362 liters per hour per approximately 0.31 meters of the width.

55. A separator comprising:

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an input compartment having an input opening and an output opening;

5 a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from about 0.23mm to equal to or less than 0.64mm; and

a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

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56. A separator comprising:

an input compartment having an input opening and an output opening;

15 a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from equal to or greater than 0.23mm to equal to or less than 0.89mm; and

20 a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

57. A separator comprising:

an input compartment having an input opening and an output opening;

25 a sloped screen connected to the output opening of the input compartment, the sloped screen having a plurality of screen openings, the screen openings having a size that ranges from equal to or greater than 0.23mm to equal to or less than 0.64mm; and

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a collection compartment connected to the sloped screen, the collection compartment having an air flow opening and a slurry exit opening.

5 58. A method for removing solids from a manure slurry, the method comprising the steps of:

 running the manure slurry over a slopped screen, the slopped screen having a width and a plurality of screen openings;

 spraying the manure slurry with a liquid with a sprayer at a rate,
10 the rate ranging from equal to or greater than 113 liters per hour to equal to or less than 1362 liters per hour per approximately 0.31 meters of the width; and

 collecting a screened slurry that falls through the sloped screen in a collection compartment.

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